Be sure you are right
AN OUNCE OF PREVENTION IS BETTER THAN A POUND OF CURE
Lack of Precaution

Do You Appreciate What Proverb on Cover Means?

"Where is Man Without Science?"

IT must be almost as obvious as an axiom to the steam user and consumer that no single compound could be manufactured which would prove efficacious in removing the incrustation from the water surface of the boiler and preventing the further scale formation caused by the great affinity existing between the salts of lime, magnesia, silica, etc., and hot metal. Then again, the pipes and boiler connections are often eaten through, and it is a common occurrence to find the boiler plates and flues badly pitted and grooved, which is caused either by direct corrosive action due to the presence of a free acid in the water, or a galvanic action caused by the presence of an excess of sodium salts.

All such formations and deleterious actions are formed from waters entirely different from each other, the mineral salts embodied therein not only having different chemical properties, but different physical properties as well; and the difference in the percentage of salts in each water is governed by the nature of the soil from which the source of supply is obtained. Under these conditions it is self-evident that directions prescribed for one water could not be applicable to another.

"Judicious Investigation Brings Universal Success."

WITH an extensive and completely equipped laboratory, we are able to handle this subject, making preparations to overcome the different known deleterious actions taking place in the steam boiler, in a scientific manner, by analyzing the feed water and making a diagnosis of the case at hand. We have no proprietary article on hand, but after learning with what we have to contend, we write a prescription for the ingredients and give such directions as will be suitable for the water used under the given conditions. This prescription is sent to our Works, where it is filled, filed, recorded and numbered, and can be refilled when wanted, the same as a prescription is handled by a dispensing pharmacist in a drug store.

In this way we are handling the subject in an intelligent and systematic manner, getting at the root of the existing evil, overcoming the difficulties, and insuring the safe and economical running of steam boilers and all other steam receptacles. These methods also enable the steam user to always obtain identically the same especially prepared and uniformly made preparation.

"Vegetable Treatment is the Proper Course."

ANOTHER feature of our business which appeals to man's common sense is the fact that our works are equipped with all modern apparatus for grinding and preparing different barks and drugs and producing the different extracts we use in making up our compounds. We buy all our material in the crude form, being brokers in the different gums, drugs, etc., taking advantage of the market at different seasons. Being the only house of this kind in the world with the above facilities, we are able to give the consumer a better price, as well as better results, from our methods.

The compounds made by us are of purely vegetable composition, analytically prepared to meet the requirements of the mineral ingredients and other objectionable constituents of the water, the percentage of each mineral salt governing the percentage of the antidotal ingredient of the compound. By these methods we avoid the use of an excess or deficiency of any part of the compound, every pound being utilized in the reaction taking place. There is no mechanical, unknown or unlooked for result obtained from the use of our goods; we cause a complete chemical reaction to take place between the deleterious constituents of the water and the ingredients of our compounds.

"Doctors of Waters."

OUR aims are as follows: In boilers badly coated with incrustation, we convert this scale formation (which is composed principally of the salts of lime, magnesia, silica, traces of aluminum, sodium, etc., which are of a crystallizable form having a great affinity for hot metal) into tannates, gallo-tannates and saccharates of lime, magnesia, etc., which are of a non-crystallizable form having no affinity for hot metal, being of an inert nature, the physical properties having the nature of a soft, oozy mud of the same specific gravity as the water, so that there is no danger of this newly formed mud settling and burning the sheets.

In trying to clean a dirty boiler with sodium salts, or the general run of preparations on the market today, the scale not only comes off in pieces (which is called the sweating process), but that part which is converted into mud is of such a heavy, tenacious form that there is great danger of it settling, burning and bagging the sheets, and causing incalculable damage. The injurious effects and non-conductive qualities of the scale are too familiar to the reader to justify or require any comment.

"The Compounds that Compound Most."

CONDENSING plants, also those heated with exhaust steam, where the condensation is returned to the boilers, have more or less trouble from oil conveyed back to the boilers with the condensation, which is the cause of buckling of tubes in the water tube boilers and water tube furnaces, the bagging of the fire sheet, burning of the crown sheet, etc.

Over 90 per cent. of mineral cylinder oil stock is so poor in its viscosity and fire tests that it must be built up with tallow or animal oil to get the lubrication (it seems as though the more rancid and stronger it is, the better it suits the average oil compounder), consequently we get large quantities of animal oil into our boilers in the return condensation.

The animal oil contains oleic acid which forms oleates of lime and magnesia (insoluble soap), which have the physical properties of a gutta percha, gluey, sticky, non-conducting substance, and a great affinity for the hot metal.

THE mineral oil forms a mechanical mixture. Both the oleates of lime and magnesia (due to the chemical reaction) and this mechanical mixture, form little globular masses on the top of the water which stick together and become heavier in gravity than the water; they are then carried with the circulation to the bottom and hotter parts of the boiler, where they adhere to the hot metal and spread over the surface, forming a non-conductor, preventing the absorption of the heat units from the transmitter (iron and steel) by the water, concentrating the heat in given parts of the transmitter (fire sheet, crown sheet, water tubes, etc.), which brings the heat to a much higher degree and the transmitter to a red or white heat, when same begins to melt or flow, and the pressure from within forces it out, forming a little bag or blister.

Do not use soda preparations, as sodium salts would form oleates of sodium (a soluble soap, which is the same as all soap used in washing) and saponify the water, causing it to foam and carry over into the engine and system.

"Appliers of Chemical Science to Mechanical Engineering."

WE are making preparations of tannin extracts and starches which readily convert this oil into the oleates and albuminoids of tannin, which have the physical properties of a sludge of about the same gravity as the water, and will readily wash out with same when cleaning boilers. They are of an inert nature, having no affinity for hot metal or surfaces, and will cause no deleterious effect in the steam boiler or system.

Pitting and grooving and eating away of the iron by too pure a water, or from an excess of sodium salts, such as we occasionally find in well waters, or the same effects from having used soda or some soda compound, can be successfully prevented by allowing us to make a special preparation of these tannin extracts, sugars, etc., which will satisfy the water, neutralizing all the deleterious ingredients and successfully overcoming all such actions without producing any after effects.

"Water Chemists."

WE have found, after repeated experiments and careful investigation made in our laboratories, that the transmission of heat units to water through scale, as compared with iron, is 1.2 to 37.34. A coating of scale 1-16 of an inch in thickness, requires about 13 per cent. more fuel; 1-8 of an inch, 28.5 per cent. more fuel. The extra consumption of fuel will increase according to this ratio as the scale formation becomes greater. There are several tables published relative to the loss of the heat units in the non-conductivity of the scale formation, which are all very nearly correct, the variation being very small.

Our laboratories are at the disposal of the steam consumer on this subject. All analytical work, such as the analysis of samples of water, incrustation, proprietary so-called boiler compounds, coal, and consultation on this subject, are done free for the consumer.

"A Thorough Report of Analysis Promptly Mailed to the Sender, Free of Charge."

DIRECTIONS for sending samples for analysis are as follows; WATER—Take a clean gallon jug, rinse it thoroughly with the water it is to be filled with, then fill the jug, insert a clean cork, seal and forward by express, prepaid, to our address. INCRUSTATION—Secure two or three small pieces of scale or incrustation from different parts of the boiler, the whole weight not aggregating over one-half ounce, and send by mail. We never make analyses of scale unless requested to do so by the steam user for his own information, as it is not necessary in making our compounds, the analysis of the sample of water being sufficient for that purpose.

So-called BOILER COMPOUNDS—If the article is a solid or powder, an average sample weighing about one ounce will be sufficient. Send by mail. If the article is a liquid, take a two-ounce bottle, fill with a well-collected sample, stirring well the liquid before filling, and send by express, prepaid. COAL—[see following page].

"General Chemists on Water Investigations."

COAL—Take a few ordinary lumps from different parts of the supply so as to get as fair an average as possible, crush this all together and divide into four parts; take one of these parts, rub well together, divide into four parts, and so on until you have about one ounce. Send by mail.

All reports of analyses will be mailed free to the sender. Our Vegetable Compounds are giving perfect results all through the United States and Canada, and lists of reliable firms using our goods, and references, will be given on receipt of request.

☞**CAUTION.** A demand for an article to overcome or accomplish certain results calls for a great deal of experimenting, which is generally done by different parties at the consumer's expense. These impostors or copyists are enabled to carry on their wild experimenting without any foundation to work on, due to an equal lack of knowledge on the part of the consumer. There are people who are trying to steal our thunder; they copy our advertisements, claim to analyze waters, etc., the same as we do, and tell all kinds of absurd stories. We believe we have the only scientific laboratory treating on this subject, but leave the consumer to find out for himself.

"All Scientific Investigation and Analytical Work Relative to this Subject Carried on Free for Customers."

WM. H. EDGAR, President.

Manufacturing and Analytical
Chemists

Dearborn Drug & Chemical Works

Makers of Vegetable Boiler Compounds
Waters Analyzed free

Offices: Nos. 29, 30, 31, 32 and 33 Rialto — Telephone No. 3935 Main
Works: Nos. 2325-27-29 La Salle Street — Telephone No. 1130 South

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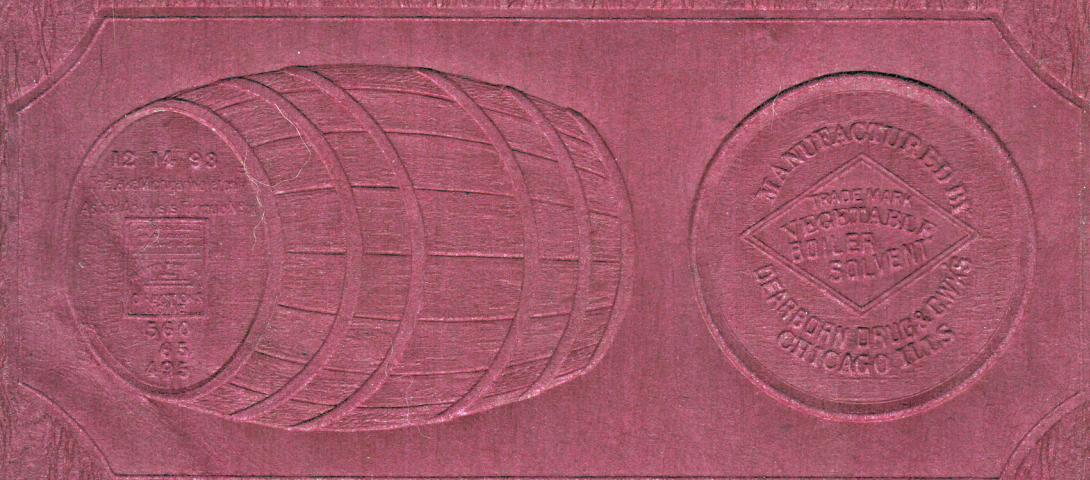
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